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A2A4X A2E9 A2L A20T15**

(56) Documents Cited

**GB 2287214 A GB 2268700 A GB 2236705 A
GB 2185708 A GB 1454935 A**

(58) Field of Search

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INT CL⁶ B29C 49/20 70/68 70/78 , B29D 22/00**

(54) Moulded articles with inserts retained inside a mould during moulding

(57) A moulded article (10) and a method of producing a moulded article comprising releasably retaining a panel member (14) which is to form a graphic on the article (10) on an internal surface (32,34) of a mould (30) using retaining means (40,42,46) not located between the panel member (14) and the internal surface (32,34) of the mould (30), and then moulding an article (10) within the mould (30) such that the panel member (14) is moulded into or onto the external surface of the article (10). A blow moulding technique is used.

The article is a traffic sign bollard. The members 14 may be coloured.

Suction is used as the retaining means.

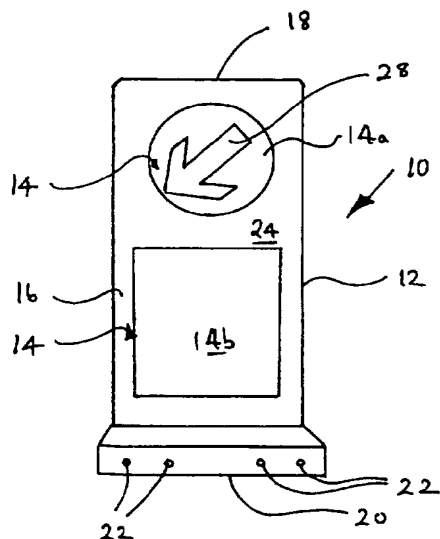


FIG 1

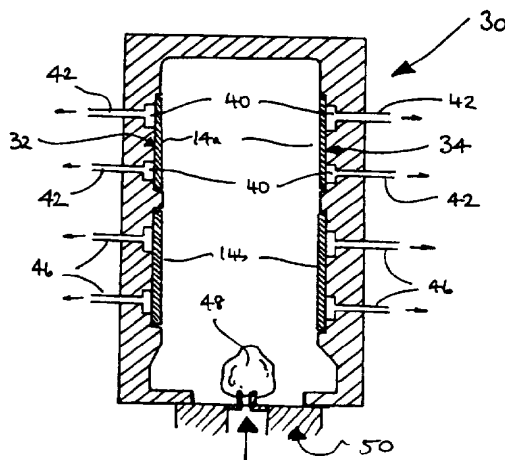


FIG 4

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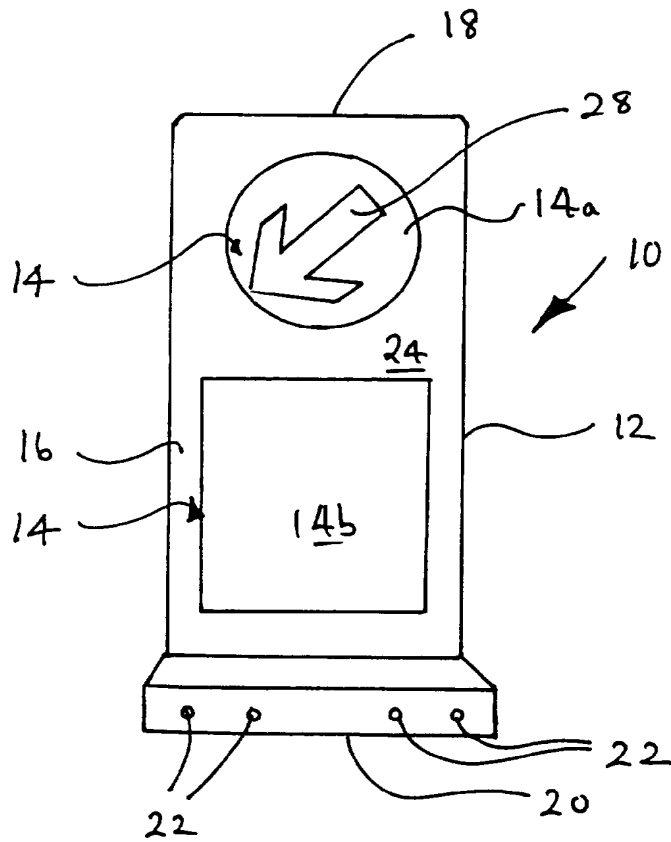


Fig 1

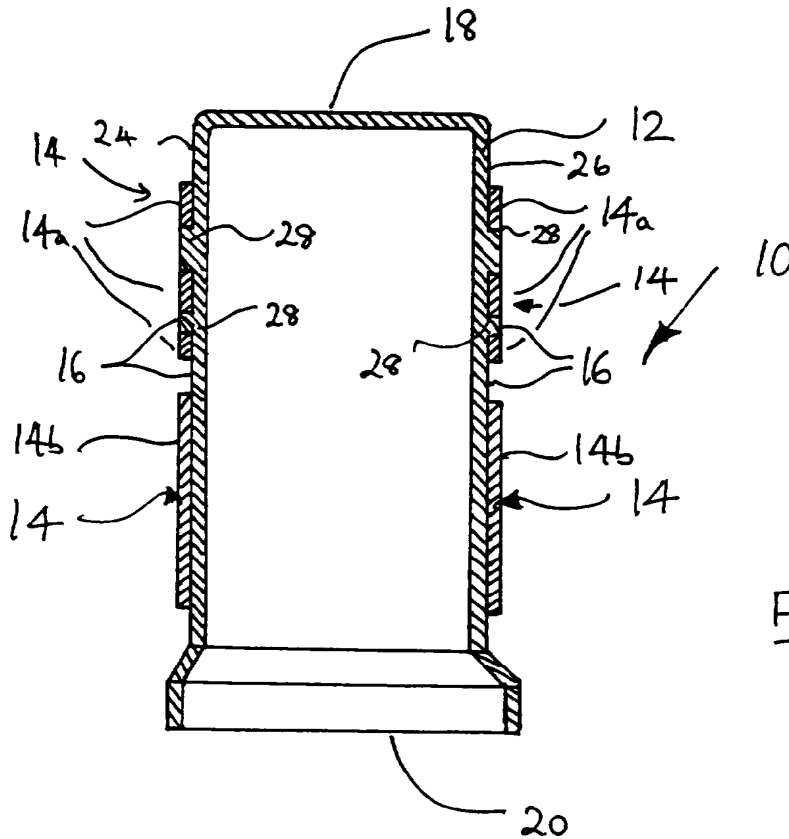


Fig 2

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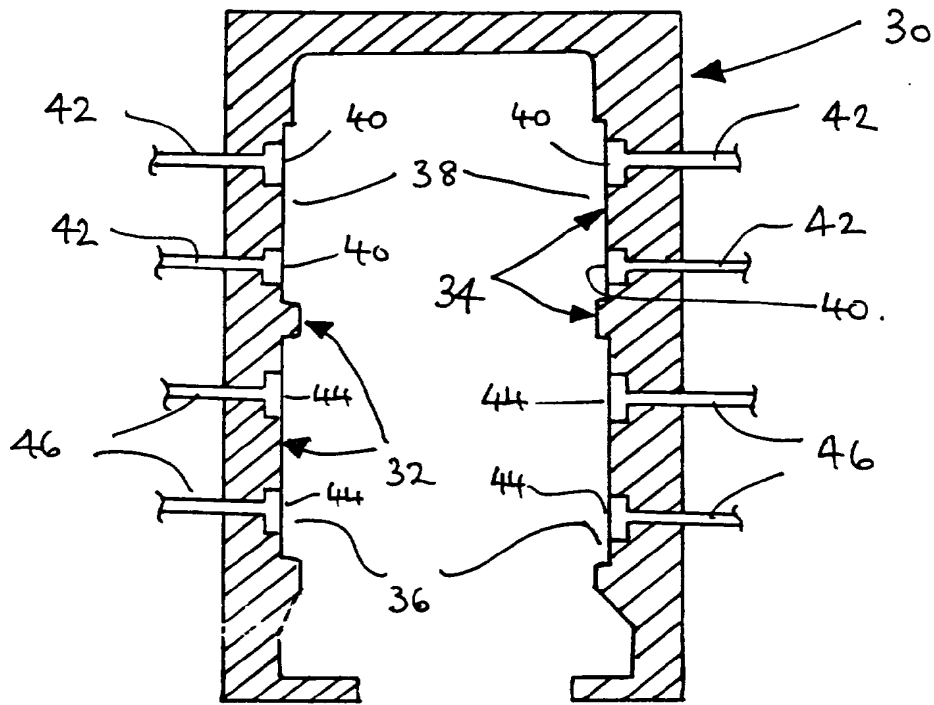


FIG 3

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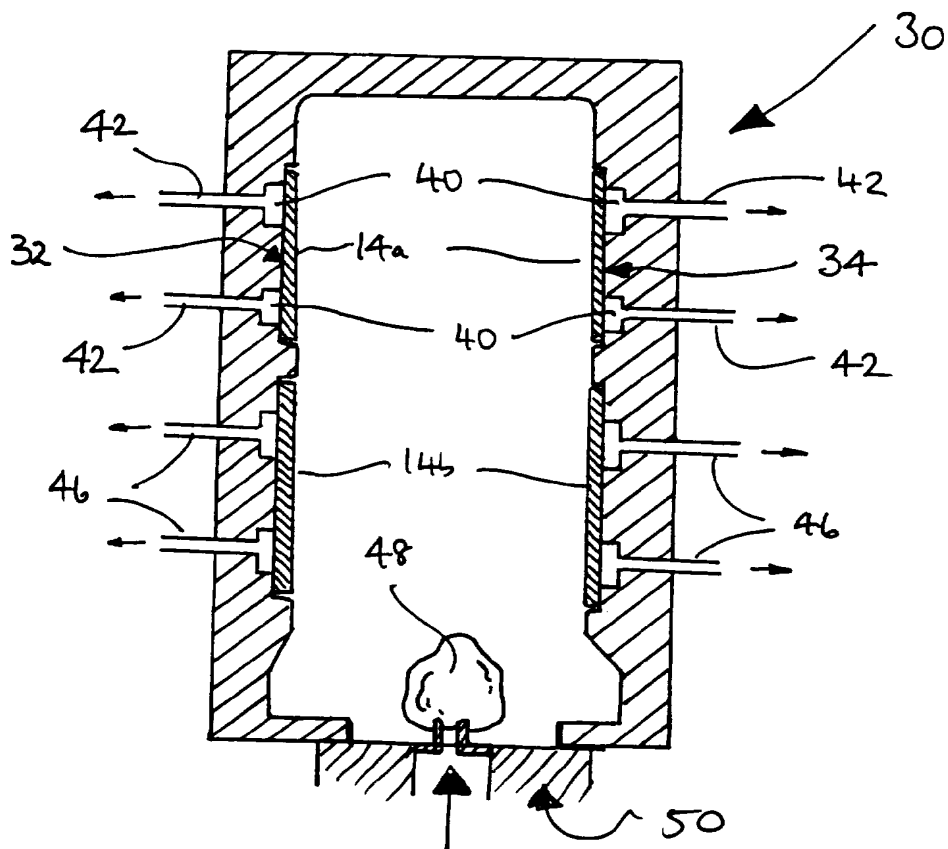


FIG 4

IMPROVEMENTS IN OR RELATING TO MOULDED ARTICLES

The present invention concerns improvements in or relating to moulded articles and methods of moulding articles, and in particular but not exclusively to bollards and signs and methods of moulding bollards and signs.

There are several known methods for moulding hollow synthetic resinous material products, for example, injection moulding, caseinal moulding and rotational moulding. Each method is particularly suitable to certain applications and it has been found, for example, that rotational moulding is the most suitable method of moulding traffic bollards and signs.

Traffic bollards normally take the form of rectangular hollow-section pillars rotationally moulded from translucent white plastics material which has graphics material, for example, directional arrows and warning panels of a colour which is different from the colour of the bollards, applied to their outer surface. Illuminating means is also often provided within the bollard. It is normal for these bollards to be mounted on a steel rim at their base, the rim in turn being connected to a mounting fixed in and projecting from a road or footpath, to fix the bollard in position for use.

Conventionally the graphics material applied to these rotationally moulded bollards comprises a film-like sheet or transfer which is applied to the outside of the bollard during production. This technique has the drawback of being relatively expensive. Furthermore, the bollard thus formed can be readily defaced either accidentally or through vandalism since the graphic material thereon is in the form of a film and can be readily scratched away.

It is an object of the present invention to obviate or mitigate these disadvantages.

According to the present invention there is provided a method of moulding an article from plastics material, the method comprising removably holding a panel member to the internal surface of a mould with means not located between the panel member and the internal surface, and moulding an article within the mould such that the panel member is moulded into or onto the external surface of the article.

Preferably the article is moulded using a blow moulding technique.

Preferably the panel member is held onto the internal surface of the mould by suction. Preferably one or more conduits connects the internal surface to a

source of suction, such as a vacuum, such that when suction is applied a panel member is held in a desired position in the mould. Preferably the suction is removed during removal of the article from the mould following moulding. The or at least one of the conduits may be enlarged in the region thereof opening to the internal surface to provide a suction pad in the internal surface. Desirably at least two pads are provided to hold a panel in the mould.

Preferably a panel member is held located in a recess formed in the internal surface of the mould to ensure that the panel member is in the desired position for moulding.

Preferably a plurality of panel members are held in the mould during moulding to form an article comprising a plurality of panel members. A plurality of holding means and desirably recesses may be provided to hold the panel members. A panel member used may comprise one or more openings therein into which plastics material of the article may extend during moulding.

Further according to the present invention there is provided a moulded article formed by a method as described in any of the preceding five paragraphs, from plastics material, and comprising a body and a panel member moulded into or onto the

external surface of the body.

Preferably the panel member has a thickness of between 10% and 60% of the thickness of a wall of the body to which it is moulded, and may be flush with or stand proud of the external surface of the body.

A plurality of panel members may be provided in or on the external surface of the article.

The panel member may comprise one or more openings therein into which plastics material of the body of the article may extend. Preferably the opening(s) have the shape of graphics or an emblem to be provided on the article. Preferably the panel member is of a different colour to the body of the article.

Preferably the article is a traffic sign comprising a body produced by said method and graphic material formed by said panel member.

According to a still further aspect of the present invention there is provided a mould for use in a method and for forming an article substantially as described in any of the preceding ten paragraphs.

An embodiment of the present invention will now be described by way of example only with reference to the accompanying drawings in which:

Fig. 1 shows a front view of a traffic bollard according to the present invention;

Fig. 2 shows a cross-section through one side of the bollard of Fig. 1;

Fig. 3 shows diagrammatically a cross-section through a blow mould according to a further aspect of the present invention; and

Fig. 4 shows diagrammatically a cross-section through the mould of Fig. 3, immediately prior to moulding of an article according to the present invention.

With reference to the drawings, a traffic bollard 10 which, according to the present invention, is manufactured from plastics material by a blow moulding technique, comprises a body 12 and a panel member 14 of plastics material moulded into the external surface 16 of the body.

In more detail, the body 12 is a hollow square cross-sectional pillar having a closed top 18 and open base 20. A galvanised steel rim (not shown) is affixed inside the bollard 10 at its base 20 by any convenient means, for example, pop rivets 22 to provide mounting

means cooperable with attachment means fixed in the road, or pavement to fix the bollard 10 on the road or pavement. The bollard 10 normally accommodates illuminating means, however since these do not form part of the present invention, they will not be described in this specification.

The body 12 is moulded from a translucent white coloured plastics material which may be low density polyethelene or ethylene vinyl acetate. One or more copolymers may be included to give the bollard desired characteristics.

A plurality of different panel members 14 are shown in the bollard 10. A circular panel member 14a is provided toward the top of two opposing sides 24,26 of the body 12. The panels 14a are coloured, and each comprise a cut out portion 28 in the shape of an arrow, which is filled with the white plastics material of the body 12 such that the arrow is clearly visible from outside the bollard 10.

A further rectangular panel member 14b is provided in each of the sides 24,26 beneath the panel members 14a. These members 14b are also coloured, for example orange or yellow.

The panel members 14a,b thus provide graphics,

emblems or signs on the outer surface of the bollard 10.

The bollard 10 is formed in a mould 30 which is illustrated diagrammatically in Figs. 3 and 4. The internal surfaces 32,34 of the mould 30 correspond to the respective sides 24,26 of the bollard 10 and each comprises a rectangular recess 36 and a circular recess 38 formed therein, the depth of each of which is between about 10% and 60% of the thickness of the body 12 to be moulded therein.

Two vacuum pads 40 are provided in each of the circular recesses 38, and are connectable by conduits 42 having valve means (not shown) to a suction source (not shown). Similar vacuum pads 44 are provided in the rectangular recesses 36, connected via conduits 46 to the suction source.

The mould 30 is longitudinally split to facilitate loading and unloading and prior to closing the mould 30 before the initiation of the blow moulding of the bollard 10, the suction source is activated and the appropriate panel members 14a,b are located in the desired orientation in the recesses 36,38 and held therein by the suction. The mould 30 is then closed and a charge 48 of plastic material (Fig. 4) from which the body 12 is to be formed is introduced into the mould 30, connected to apparatus 50 normally employed in a blow

moulding operation. Air or gas is then blown by the apparatus 50 to inflate the charge 48 while heat is applied thereto. This blow moulding operation causes the charge 48 to adopt the shape defined by the mould 30 and panel members 14a,b to form the bollard 10. The panel members 14a,b in the recesses 36,38 fuse into the external surface of the body 12 thereby providing signs/graphics on the outer surface of the bollard, which cannot be readily peeled off or scratched. The plastics material of the charge enters and fills the cut out in each of the circular panel members 14a, such that the arrow comprises white plastics material defined by the coloured panel member 14a.

The mould is then unloaded in the normal way after the suction source has been deactivated.

It is to be appreciated that since the means to hold the panel members in place in the mould is not actually located between the panel members and the internal surface of the mould, then the means (suction) leaves no undesirable marks or blemishes on the panel during moulding. Further, release of the panel members and hence the moulded article from the mould is facilitated by deactivation of the suction prior to removal.

Various modifications can be made without departing from the spirit or scope of the invention.

For example, any hollow moulded article carrying graphics material can be formed from this technique, such as alternative traffic signs or other display material. The relative colours of the panel members and body can be varied as desired in accordance with the application of the particular moulded article.

Any suitable plastics materials can be used, such as low density polyethelene and metho-vinyl acetate to give a relatively resilient product and a relatively rigid product. The resilient product is particularly useful for use in traffic sign applications whereby if it is accidentally contacted by a relatively low force it will, after removal of the force, spring back to its original condition.

In a further modification recesses are not provided in the internal mould surface, but the panel members are applied on the surface thereby resulting in a moulded article in which the panel member is recessed into the blow moulded body, as opposed to standing proud therefrom as in the embodiment described above.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims

protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

CLAIMS

1. A method of moulding an article from plastics material, the method comprising removably holding a panel member to the internal surface of a mould with means not located between the panel member and the internal surface, and moulding an article within the mould such that the panel member is moulded into or onto the external surface of the article.
2. A method as claimed in claim 1, in which the article is moulded using a blow moulding technique.
3. A method as claimed in claim 1 or claim 2, in which the panel member is held onto the internal surface of the mould by suction.
4. A method as claimed in claim 3, in which one or more conduits connects the internal surface to a source of suction such that when suction is applied a panel member is held in a desired position in the mould.
5. A method as claimed in claim 4, in which the suction source is a vacuum.
6. A method as claimed in any of claims 3 to 5, in which the suction is removed during removal of the article from the mould following moulding.
7. A method as claimed in any of claims 4 to 6, in which the or at least one of the conduits is enlarged in the region thereof opening to the internal surface to provide a suction pad in the internal surface.
8. A method as claimed in claim 7, in which at least two pads are provided to hold a panel in the mould.
9. A method as claimed in any preceding claim, in which a panel member is held located in a recess formed in the internal surface of the mould to ensure that the panel member is in the desired position for moulding.

10. A method as claimed in any preceding claim, in which a plurality of panel members are held in the mould during moulding to form an article comprising a plurality of panel members.
11. A method as claimed in claim 10, in which a plurality of holding means is provided to hold the panel members.
12. A method as claimed in claim 10 or claim 11, in which a plurality of recesses is provided to hold the panel members.
13. A method as claimed in any preceding claim, in which a panel member used comprises one or more openings therein into which plastics material of the article may extend during moulding.
14. A moulded article formed by a method as claimed in any preceding claim from plastics material, and comprising a body and a panel member moulded into or onto the external surface of the body.
15. A moulded article as claimed in claim 14, in which the panel member has a thickness of between 10% and 60% of the thickness of a wall of the body to which it is moulded.
16. A moulded article as claimed in claim 14 or claim 15, in which the panel member is flush with the external surface of the body.
17. A moulded article as claimed in claim 14 or claim 15, in which the panel member stands proud of the external surface of the body.
18. A moulded article as claimed in any of claims 14 to 17, in which a plurality of panel members is provided in or on the external surface of the body.
19. A moulded article as claimed in any of claims 14 to 18, in which the

panel member comprises one or more openings therein into which plastics material of the body of the article extends.

20. A moulded article as claimed in claim 19, in which the opening(s) have the shape of graphics or emblem(s) to be provided on the article.

21. A moulded article as claimed in any of claims 14 to 20, in which the panel member is of a different colour to the body of the article.

22. A moulded article as claimed in any of claims 14 to 21, in which the article is a traffic sign.

23. A mould for use in a method and for forming an article substantially as described in any of the preceding claims.

24. A mould as claimed in claim 23, in which the mould provides for a panel member to be retainable therein by means of suction.

25. A mould as claimed in claim 24, in which the mould comprises one or more conduits connecting the internal surface of the mould to a suction source, such as a vacuum.

26. A mould as claimed in claim 25, in which the or at least one conduit is enlarged in the region thereof opening to the internal surface to thereby provide a suction pad in the internal surface.

27. A mould as claimed in claim 26, in which at least two suction pads are provided to retain a panel member in position in the mould.

28. A mould as claimed in any of claims 23 to 27, in which a recess is provided in the internal surface of the mould in which a panel member is locatable whereby to assist correct positioning of the member in the mould.

29. A mould as claimed in any of claims 23 to 28, in which the mould comprises at least two detachable parts.
30. A method substantially as hereinbefore described with reference to the accompanying drawings.
31. An article substantially as hereinbefore described with reference to the accompanying drawings.
32. A mould substantially as hereinbefore described with reference to the accompanying drawings.
33. Any novel subject matter or combination including novel subject matter disclosed, whether or not within the scope of or relating to the same invention as any of the preceding claims.



Application No: GB 9607551.0
Claims searched: 1-32

Examiner: Monty Siddique
Date of search: 25 June 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK Cl (Ed.O): B5A (AB2, AB3, AT15P)
Int Cl (Ed.6): B29C 49/20 70/68 70/78; B29D 22/00
Other: Int Cl (Ed.5): B29C 67/18

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2287214 A (MATSUSHITA) pin 120 initially holding insert 101 and is not located between insert and adjacent wall	1,14,23 at least
X	GB 2268700 A (CLEARPLAST LTD) page 10 lines 23-26; retained by suction	1,3,14,23, 24 at least
X	GB 2236705 A (SUMITOMO) insert 3 held by bar 16/17 which is not located between insert and adjacent wall	1,14,23 at least
X	GB 2185708 A (AB CERBO) page 1 lines 5-22, initial holding of panel-like member by suction	1,3,14,23, 24 at least
X	GB 1454935 (A/S SELVAAGBYGG) panel 3 retained by suction	1,3,14,23, 24 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.